

APPENDIX C TO PART 230—FRA INSPECTION FORMS

Appendix C - FRA Inspection Forms**Form No. 1 31 and 92 Service Day Inspection Report**

Date of _____ Owner _____ Locomotive Initials _____
 Inspection _____ Operator _____ Locomotive No. _____

31 and 92 Service Day Requirements

Instructions: Non-complying conditions shall be repaired and this report approved before the locomotive is returned to service. Where condition is called for, enter either: (1) **Good** - No defects which could be discovered by a reasonable inspection; (2) **Fair** - Functioning less than optimally but safe and suitable and not in violation of the regulations; or (3) **Poor** - Not in compliance with the regulations. In any case N/A means - not applicable.

Was boiler washed? _____ Were steam leaks repaired? _____
 Were water gauge and valve passages cleaned? _____ Condition of draft system and draw gear. _____
 Were gauge cock passages cleaned? _____ Condition of running gear. _____
 Were all washout plugs removed and inspected? _____ Condition of driving gear. _____
 Were arch tubes, circulators, siphons and water bar tubes Condition of spring/equalizing system. _____
 cleaned and inspected? _____ Condition of tender running gear. _____
 Were fusible plugs removed, cleaned & inspected? _____ Condition of brake equipment. _____
 Were staybolts hammer tested? _____ Were injectors tested and in good condition? _____
 Were all broken staybolts replaced? _____ Was feedwater pump tested and in good condition? _____

92 Service Day Requirements

Date of previous 92 Service Day Inspection _____ Were tubular water glasses renewed? _____
 Safety relief valves pop at _____ psi _____ psi _____ psi Were air compressor(s) orifice tested? _____
 Were all steam gauges tested? _____ Was main reservoir tested for leakage? _____
 Were all air brake gauges tested? _____ Were brake cylinders tested for leakage? _____
 Were steam gauge siphon pipe(s) cleaned? _____ Was tender tank entered and inspected? _____
 If no 92 Service Day Inspection is done, enter number of service days used since last 92 Service Day Insp. _____

 INSPECTOR The above work has been performed and the report is
 approved. _____
 _____ OFFICER IN CHARGE
 INSPECTOR

Form No. 2

Daily Locomotive Inspection Report

Date of _____ Owner _____ Locomotive Initials _____
 Inspection _____ Operator _____ Locomotive No. _____

Instructions: Non-complying conditions shall be repaired and this report approved before locomotive is returned to service. This report shall be filed even if no non-complying conditions are reported, however it does not have to be approved before the locomotive is returned to service if no non-complying conditions are reported. Locomotive, including its tender and appurtenances, shall be inspected each day it is offered for use.

Repairs needed:**Repairs done by:**

CONDITION OF WATER GLASSES: _____

CONDITION OF AIR COMPRESSOR: _____

CONDITION OF GAUGE COCKS: _____
LP _____ psi

MAIN RESERVOIR PRESS.: HP _____ psi,

CONDITION OF INJECTORS / PUMPS: _____

BRAKE PIPE PRESSURE: _____ psi

BOILER SAFETY VALVE LIFTS AT: _____ psi

LOCOMOTIVE BRAKE PIPE LEAKAGE: _____ lbs. per minute

SEATS AT: _____ psi

CONDITION OF BRAKES: _____

CONDITION OF PISTON ROD AND VALVE STEM PACKING _____

CONDITION OF SANDERS: _____

Where condition is called for enter:

Good - No defects which could be discovered by a reasonable inspection.**Fair** - Functioning less than optimally but is in safe and suitable condition, and not in violation of the rules.**Poor** - Not in compliance.**N/A** - Not applicable.

Inspector's signature: _____ Occupation: _____

The above work has been performed, except as noted, and the report is approved
by: _____**Approved****Note:** Additional items may be added to this form if desired._____
Occupation
Date

Federal Railroad Administration, DOT

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Form No. 3

Annual Inspection Report

Date of _____ Owner _____ Locomotive Initials _____
 Inspection _____ Operator _____ Locomotive No. _____

Instructions: Non-complying conditions shall be repaired and this report approved before the locomotive is returned to service. Where condition is called for, enter either: (1) **Good** - No defects which could be discovered by a reasonable inspection; (2) **Fair** - Functioning less than optimally but safe and suitable and not in violation of the regulations; or (3) **Poor** - Not in compliance with the regulations. In any case N/A means - not applicable.

Boiler hydrostatically tested to _____ psi, at a water temperature of _____ degrees F.
 Was boiler washed? _____ Were steam gauge siphon pipe(s) cleaned? _____
 Were water gauge and valve passages cleaned? _____ Were steam leaks repaired? _____
 Were gauge cock passages cleaned? _____ Were tubular water glasses renewed? _____
 Were all washout plugs removed and inspected? _____ Were fusible plugs removed, cleaned & inspected? _____
 Were arch tubes, circulators, siphons and water bar tubes Flexi caps removed on (date) _____
 cleaned and inspected? _____ Were all air brake gauges tested? _____
 Thickness of arch tubes _____; Water bar tubes _____ Main reservoir hydro _____ psi, hammer _____
 Dry pipe thickness _____; Circulator thickness _____ NDE _____, Drilled _____
 Were water column passages cleaned and inspected? _____ Were brake cylinders tested for leakage? _____
 Was boiler entered and inspected? _____ Was main reservoir tested for leakage? _____
 Were drilled flexible staybolt telltale holes tested? _____ Were air compressor(s) orifice tested? _____
 Were staybolts hammer tested? _____ Condition of driving gear _____
 Were all broken staybolts replaced? _____ Condition of running gear _____
 Were longitudinal lap seams inspected? _____ Condition of draft system and draw gear _____
 Was smoke box entered and inspected? _____ Condition of spring/equalizing system _____
 Safety relief valves pop at _____ psi _____ psi _____ Condition of brake equipment _____
 Were injectors tested and in good condition? _____ Condition of tender running gear _____
 Was feedwater pump tested and in good condition? _____ Was tender tank entered and inspected? _____
 Were all steam gauges tested? _____

The above work has been performed and the report is approved. _____

INSPECTOR

OFFICER IN CHARGE

INSPECTOR

Locomotive Air Brake Cleaning, Testing and Inspection Record

EQUIPMENT	SERVICE PERIOD	Previous Inspection	Current Annual Date	Inspection Date	Inspection Date	Inspection Date	Inspection Date	Notes
AIR COMPRESSOR ORIFICE TEST	92 service day							
AIR GAUGES	92 service day							
MAIN RESERVOIR LEAKAGE	92 service day							
BRAKE CYLINDER LEAKAGE	92 service day							
FILTERS	Annual Inspection							
DIRT COLLECTORS	Annual Inspection							
MAIN RESERVOIR HYDRO, HAMMER, NDE	Annual Inspection							
BRAKE VALVES	368 service days or second							

FRA Form 4

BOILER SPECIFICATION CARD

Locomotive No. _____; Boiler No. _____; Date built _____

Boiler built by: _____

Owned by: _____

Operated by: _____

Type of boiler: _____; Dome, where located: _____

BOILER SURVEY DATA

Where condition is called for, use: **New** - New material at the time of the boiler survey; **Good** - Little or no wear and/or corrosion; **Fair** - Obvious wear and/or corrosion.

Boiler Shell Sheets

Material:	Type of Material (wrought iron, carbon steel, or alloy steel)	Carbon Content	Condition
1st course (front)	_____	_____	_____
2nd course	_____	_____	_____
3rd course	_____	_____	_____
Rivets	_____	n/a	n/a

Documentation of how material was determined shall be attached to this form.

Measurements:	Thickness	At Seam	Thinnest	ID	ID
Front flue sheet,	thickness	n/a	_____	_____	_____
1st course,	thickness	_____	_____	_____	_____
2nd course,	thickness	_____	_____	_____	_____
3rd course,	thickness	_____	_____	_____	_____

When courses are not cylindrical give ID at each end

Is boiler shell circular at all points? _____

If shell is flattened, state location and amount _____

Are all flattened areas of shell stayed adequately for the pressure allowed by this form? _____

Water Space at Mud Ring: Sides _____, Front _____, Back _____

Width of water space at sides of fire box measured at center line of boiler: Front _____, Back _____

Firebox and Wrapper Sheets

Firebox sheets:	Thickness	Material	Condition
Rear flue sheet	_____	_____	_____
Crown	_____	_____	_____
Sides	_____	_____	_____
Door	_____	_____	_____
Combustion chamber	_____	_____	_____
Inside throat	_____	_____	_____

Wrapper sheets:

Throat	_____	_____	_____
Back head	_____	_____	_____
Roof	_____	_____	_____
Sides	_____	_____	_____

Steam Dome

Dome is made of _____ pieces (not including seam welts, if any). Top opening diameter _____
 Middle cylindrical portion - ID _____, Opening in boiler shell, longitudinally - _____

Dome sheets:	Thickness	Material	Condition
Base	_____	_____	_____
Middle cylindrical portion	_____	_____	_____
Top	_____	_____	_____
Lid	_____	_____	_____
Boiler shell liner for steam dome opening:	_____	_____	_____
Is liner part of longitudinal seam?	_____	_____	_____

Arch Tubes, Flues, Circulators, Thermic Siphons, Water Bar Tubes, Superheaters, and Dry Pipe

Arch tubes: OD _____, wall thickness _____; number _____; condition _____

Flues:

OD _____, wall thickness _____, length _____; number _____; condition _____
 OD _____, wall thickness _____, length _____; number _____; condition _____
 OD _____, wall thickness _____, length _____; number _____; condition _____

Circulators: OD _____, wall thickness _____; number _____; condition _____

Thermic siphons: number _____; plate thickness _____; condition _____
 neck OD _____, neck thickness _____; condition _____

Water bar tubes: OD _____, wall thickness _____

Superheater units directly connected to boiler with no intervening valve:

Type _____, Tube OD _____, wall thickness _____; number _____; condition _____

Dry pipe subject to pressure:

OD _____, wall thickness _____, material _____; condition _____

Stay Bolts, Crown Bar Rivets, and Braces**Stay bolts:**

Smallest crown stay diameter _____, avg. spacing _____ X _____; condition _____
 Smallest stay bolt diameter _____, avg. spacing _____ X _____; condition _____
 Smallest combustion chamber stay bolt dia. _____, avg. spacing _____ X _____; condition _____

Measurement at smallest diameter

Crown bar bolts & rivets:

Roof sheet rivets, smallest dia. _____, ave. spacing _____ X _____; condition _____
 Roof sheet bolts, smallest dia. _____, ave. spacing _____ X _____; condition _____
 Crown sheet rivets, smallest dia. _____, ave. spacing _____ X _____; condition _____
 Crown sheet bolts, smallest dia. _____, ave. spacing _____ X _____; condition _____

Braces:	Number	Total Area Stayed	Total Cross Sectional Area of Braces	
			Actual	Equivalent Direct Stay
Backhead	_____	_____	_____	_____
Throat sheet	_____	_____	_____	_____
Front tube sheet	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Safety Valves, Heating Surface, and Grate Area

Safety valves:	Total number of safety valves on locomotive _____	
Valve Size	Manufacturer	No. valves of this size and manufacture
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Heating Surface:

Heating surface, as part of a circulating system in contact on one side with water or wet steam being heated and on the other side with gas or refractory being cooled, shall be measured on the side receiving heat.

Firebox and Combustion Chamber	_____ square feet
Flue Sheets (less flue ID areas)	_____ square feet
Flues	_____ square feet
Circulators	_____ square feet
Arch Tubes	_____ square feet
Thermic Siphons	_____ square feet
Water Bar Tubes	_____ square feet
Superheaters (front end throttle only)	_____ square feet
Other	_____ square feet
Total Heating Surface	_____ square feet

Grate area: _____ square feet

Water Level Indicators, Fusible Plugs, and Low Water Alarms

Height of lowest reading of gauge glasses above crown sheet: _____

Height of lowest reading of gauge cocks above crown sheet: _____

Is boiler equipped with fusible plug(s)? _____, number _____

Is boiler equipped with low water alarm(s)? _____, number _____

Calculations**Staybolt stresses:**

Stay bolt under greatest load, maximum stress _____ psi
 Location _____

Crown stay, crown bar rivet, or crown bar bolt under greatest load, max. stress _____ psi
 Location _____

Combustion chamber stay bolt under greatest load, maximum stress _____ psi
 Location _____

Braces:

Round or rectangular brace under greatest load, maximum stress _____ psi
 Location _____

Gusset brace under greatest load, maximum stress _____ psi
 Location _____

Shearing stress on rivets:

Greatest shear stress on rivets in longitudinal seam _____ psi
 Location (course #) _____ ; Seam Efficiency _____

Boiler shell plate tension:

Greatest tension on net section of plate in longitudinal seam _____ psi
 Location (course #) _____ ; Seam Efficiency _____

Boiler plate and components, minimum thickness required @ tensile strength:

Front tube sheet	@ _____	Rear flue sheet	@ _____
1st course at seam	@ _____	1st course not at seam	@ _____
2nd course at seam	@ _____	2nd course not at seam	@ _____
3rd course at seam	@ _____	3rd course not at seam	@ _____
Roof sheet	@ _____	Crown sheet	@ _____
Side wrapper sheets	@ _____	Firebox side sheets	@ _____
Back head	@ _____	Door sheet	@ _____
Throat sheet	@ _____	Inside throat sheet	@ _____
Combustion chamber	@ _____	Dome, top	@ _____
Dome, middle	@ _____	Dome, base	@ _____
Arch tubes	@ _____	Dome, lid	@ _____
Water bar tubes	@ _____	Thermic siphons	@ _____
Dry pipe	@ _____	Circulators	@ _____

- Notes. 1. If tensile strength used is greater than 50,000 psi for steel or greater than 45,000 psi for wrought iron, supporting documentation must be furnished.
2. Any shell dimension less than 1/4" in thickness may not be adequate for support of or by other structures, particularly where threads or staybolts are concerned. Applicable codes should be consulted.

Boiler Steam Generating Capacity: _____ pounds per hour

The following may be used as a guide for estimating steaming capacity:

Pounds of Steam Per Hour Per Square Foot of Heating Surface:

Hand fired	8 lbs. per hr.
Stoker fired	10 lbs. per hr.
Oil, gas or pulverized fuel fired	14 lbs. per hr.

Record of Alterations

[illegible]

Section No.		Record of Waivers
Waiver No.	Affected	Scope and Content of Waiver

[illegible]

Calculations done by: _____; Verified by: _____

Data used to verify the foregoing specifications is current and accurate. Based upon the information contained in this document and all necessary calculations, this boiler of Locomotive (Initial & number) _____ is safe for a working pressure of _____ psi.

_____ Date _____; _____ Date _____

Locomotive Owner

Locomotive Operator

Make working sketch here or attach drawing of longitudinal and circumferential seams used in shell of boiler, indicating on which courses used and give calculated efficiency of weakest longitudinal seam.

Form No. 5

Locomotive Service Day Record

Locomotive Initial and No. _____ owned by _____ and operated by _____ was placed in service following a 1472 Service Day Inspection on (start date) _____. This locomotive shall not be operated after (date) _____, or it shall not be operated after it has accumulated 1472 service days from the above start date, whichever comes first, at which time it shall be due for a 1472 Service Day Inspection.

	Year											
Serv. days since last insp.												
Annual Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
92 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
92 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
92 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
31 Service Day Date												
Serv. days since last insp.												
Annual Date												
TOTAL												

A copy of this record shall be filed with the Regional Administrator after 31 December and prior to 31 January of each year.

Signed _____

Officer in Charge

FRA Form 19

Report of
ALTERATION ☐
or
Welded or Riveted **REPAIR** ☐

Locomotive Initials _____ Locomotive No. _____; Boiler No. _____;

Owned by _____

Operated by _____

Date work completed _____

Description of work: _____

Stress Calculations: _____

Remarks: _____

Attach drawings used in the repair or alteration or make drawings on back of this form.

Work done by: _____;

Certified by: _____

[64 FR 62865, Nov. 17, 1999, as amended at 70 FR 41996, July 21, 2005]